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IS 12664-1 (2003): Artificial Limbs - Sach Foot for Lower Extremity Prostheses, Part 1: Design and Dimensions [MHD 10: Medical Laboratory Instruments]



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भारतीय मानक
कृत्रिम अंग — निचले अग्रांगों में कृत्रिम अंग
रोपण के लिए सैशफुट (पैर)

भाग 1 डिजाइन और आयाम
(पहला पुनरीक्षण)

Indian Standard
**ARTIFICIAL LIMBS — SACH FOOT FOR LOWER
EXTREMITY PROSTHESES**
PART 1 DESIGN AND DIMENSIONS
(*First Revision*)

ICS 11.040.40, 11.180.10

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BUREAU OF INDIAN STANDARDS
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FOREWORD

This Indian Standard (Part 1) (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Artificial Limbs, Rehabilitation Appliances and Equipment for the Disabled Sectional Committee had been approved by the Medical Equipment and Hospital Planning Division Council.

This standard was first published in 1989. The present revision has been taken up to bring it in line with the present manufacturing practices prevailing in the country. In this standard the terminology (definitions) has been suitably modified. Different types of SACH (solid ankle cushion heel) foot have been added. Materials for the foot and heel have also been specified. Accordingly Table 1 covering dimensional requirements of SACH foot have also been modified and figures 3, 4, 5 and 6 have also been deleted.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ARTIFICIAL LIMBS — SACH FOOT FOR LOWER EXTREMITY PROSTHESES

PART 1 DESIGN AND DIMENSIONS

(*First Revision*)

1 SCOPE

This standard (Part 1) lays down the dimensions, design parameters and material requirements for construction of SACH foot suitable for fitment in standard oxford type shoes of corresponding sizes. It covers foot sizes from 3 to 11 only.

2 REFERENCES

2.1 The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	Title
10537: 1983	Specification for ankle bolt for SACH foot
4512: 1978	Specification for foot wear lasts, wooden (<i>first revision</i>)

2.2 The standard may be referred for lower sole profile, heel and toe width.

3 DEFINITIONS

3.0 For the purpose of this standard, definitions of various parts shall be as given in 3.1 to 3.7 (*see also* Fig. 1).

3.1 Foot Length

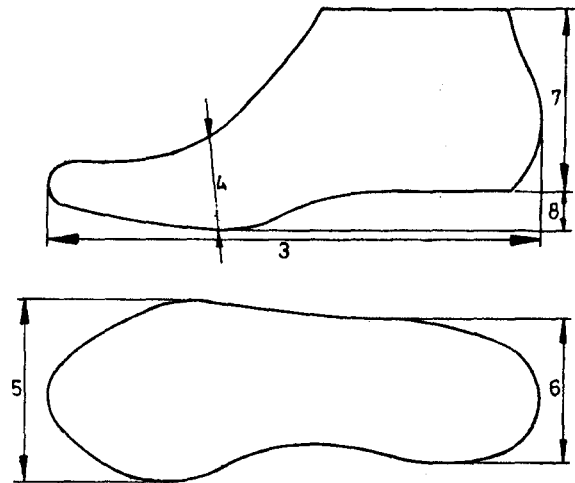
The longitudinal length between mid-section of heel and middle finger as defined in Fig. 1 with the top surface of the foot which is attached to the shin parallel to the ground.

3.2 Foot Height

The maximum height of the foot at heel section.

3.3 Heel Height

It is the distance between the heel and the ground to keep the top surface of the foot (which is attached to the shin) parallel to the ground.



- | | |
|----------------------|----------------|
| 3. Foot Length | 6. Heel Width |
| 4. Toe Circumference | 7. Foot Height |
| 5. Toe Width | 8. Heel Height |

FIG. 1 FOOT NOMENCLATURE TYPICAL

3.4 Heel Width

The maximum width of the heel, as defined in Fig. 1.

3.5 Toe Break

It is the proximal area in the forefoot region which bends/flexes while walking.

3.6 Toe Circumference

Circumference measured at toe break (tread line) section.

3.7 Toe Width

The maximum width of the foot at toe break (tread line) section.

4 TYPES

Different types of SACH foot are as follows:

- a) SACH foot with internal heel laminated construction without toes.
- b) SACH foot with internal heel moulded construction without toes.
- c) SACH foot with internal heel moulded construction with toes.

NOTE — Moulding can be of hand carved style or live cast style of finished foot.

5 MATERIALS

5.1 Foot

The following materials shall be used for making foot construction:

- Micro-Cellular rubber;
- Polyurethane foam;
- Poly-vinyl chloride foam; and
- Ethyl vinyl foam.

5.2 Heel

The following materials shall be used for making heel:

- Wood;
- Rigid polyurethane;
- Nylon;
- Delrin;
- Carbon fibre; and
- Carbon graphite.

6 SIZES AND DIMENSIONS

The dimensional details with permissible tolerances for foot of sizes 3 to 11 are indicated in Table 1.

7 SHAPE AND DESIGN

7.1 The performance of the foot depends upon its correct fitment with the shoe at various places. The shape of the foot has to be so made that it provides tight/loose/snug fitting with the shoe as indicated in Fig. 2.

7.2 To meet this requirement, every foot shall have proper shape in the toe, heel and medio-lateral surfaces.

7.3 The overall shape of the foot should match the normal foot contours, maintaining the dimensional requirements indicated in Table 1. The overall shape should also fulfil the requirements recommended for

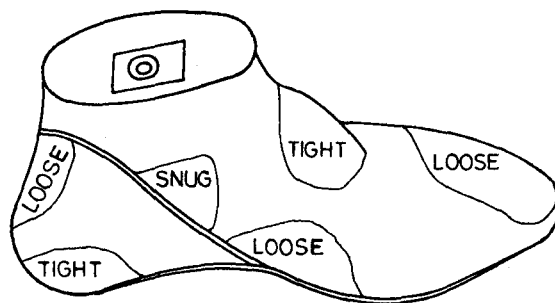


FIG. 2 FOOT SHAPE TIGHT/LOOSE/SNUG FITTING

fitting with the corresponding sizes of the shoes (as indicated in 7.1).

7.4 Adoption of Foot

The foot shall have a hole of 10 mm diameter along with the counter bore of 25 mm diameter for fixing of ankle bolt and washers as given in IS 10537. Alternatively, the provision of adoption with the prosthesis shall change suitably.

8 MARKING

8.1 Each foot shall be marked indelibly and clearly with its size and side either stamped or engraved at the lower sole.

8.2 BIS Certification Marking

The SACH foot may also be marked with the Standard Mark.

8.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act* 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standards Mark may be granted to manufacturers or producers, may be obtained from the Bureau of Indian Standards.

9 PACKAGING

The packaging shall be done as agreed to between the purchaser and the manufacturer.

Table 1 Dimensional Requirements of SACH Foot in Relation to Standard Shoe Sizes
(*Clauses 6 and 7.3*)

Shoe and Foot Size	Length of Foot mm	Toe Circum- ference mm	Toe Width (Tread Line) mm	Heel Width mm	Foot Height mm	Heel Height mm
(1)	(2)	(3)	(4)	(5)	(6)	(7)
3	<u>218</u> 223	<u>203</u> 209	<u>77</u> 79	<u>51.0</u> 52.4	<u>69</u> 71	<u>14</u> 16
4	<u>226</u> 231	<u>209</u> 215	<u>79</u> 61	<u>52.4</u> 53.8	<u>69</u> 71	<u>14</u> 16
5	<u>234</u> 239	<u>215</u> 221	<u>61</u> 83	<u>53.8</u> 55.2	<u>74</u> 76	<u>14</u> 16
6	<u>243</u> 248	<u>221</u> 227	<u>83</u> 85	<u>55.2</u> 56.6	<u>74</u> 76	<u>14</u> 16
7	<u>251</u> 256	<u>227</u> 233	<u>85</u> 87	<u>56.6</u> 58.0	<u>79</u> 81	<u>18</u> 20
8	<u>259</u> 264	<u>233</u> 239	<u>87</u> 89	<u>58.0</u> 59.4	<u>79</u> 81	<u>18</u> 20
9	<u>267</u> 272	<u>239</u> 245	<u>89</u> 91	<u>59.4</u> 60.8	<u>89</u> 91	<u>18</u> 20
10	<u>276</u> 281	<u>245</u> 257	<u>91</u> 93	<u>60.8</u> 62.2	<u>89</u> 91	<u>18</u> 20
11	<u>284</u> 289	<u>251</u> 257	<u>93</u> 95	<u>62.2</u> 63.6	<u>89</u> 91	<u>18</u> 20

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Amendments Issued Since Publication

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